

Multimedia Signal Processing in Cloud using Content Based Copy Detection



T K Thivakaran, K G Mohan

Abstract: Nowadays making multimedia and multimedia altering has gotten simple because of effectively accessible handling instruments. Progressively over facilitating sites are unreservedly accessible. So clearly we experience circumstances wherein numerous recordings and pictures that are copyrighted are getting copied effectively. Such duplication isn't just unlawful yet in addition it makes an enormous misfortune unique content holder. On the off chance that at all we attempt to distinguish such copied content, process gets extremely mind boggling in light of enormous sizes and huge amount of multimedia documents present on web. So this procedure gets perplexing and computationally costly. Content based multimedia copy detection gives a powerful and improved instrument which can distinguish coordinating rate among tremendous multimedia duplicates from the content itself without having any reliance on any product. In the system of content based copy detection, marks are made from content itself before transferring on cloud like Picasa. In the proposed framework at whatever point new Multimedia article is transferred on the cloud initially its mark is made and on the off chance that the mark matches with put away database signature, at that point this will trap the site which copies copyrighted copy with no rights.

Keywords: Cloud Computing, Multimedia, Content Based Copy Detection and Cryptosteganography.

I. INTRODUCTION

Quick improvement in the multimedia advancements has through very simple to keep and access huge measure of multimedia documents away organizes. There are bunches of simple altering and distributing instrument accessible which makes duplication of multimedia information highlight exceptionally simple which may source the infringement of advanced rights. In this way, copy rights safety turns into a basic issue for the multimedia information over the cloud. Every one of these obstacles and difficulties has made the need of building up the new component for detection of the duplicated video over the web. Repetition of copyrighted substances creates gigantic misfortune to substance proprietors. Consider a model where a gathering makes a video and deals its copyrights to a facilitating get-together state

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YouTube which pays for it per perspective on the video on YouTube to content proprietor. In any case, if that copyrighted material is spilled and facilitated on few extraordinary facilitating site then it will create misfortune to Content proprietor just as YouTube. So this copyrights taking should be gotten. Numerous issue, for example, stockpiling the executives and copyright infringement emerges due to the explanation that individuals all the more usually transfer various recordings for Business advancement or network sharing.

Capacity Management Issue: If the indistinguishable duplicates of recordings are kept in the capacity framework then the procedure turns out to be expensive as it requires huge space for putting away it. In addition, the way toward recovering that numerous duplicates of recordings turns out to be additional tedious. Thusly, if the copy duplicates of recordings are related to utilizing a simple component, at that point clearly the Storage the executives issues can be fixed viably.

Copyright Violations Issue: It has been simple now days for making changed recordings and afterward transfer them on web. This has monstrously influenced the multimedia gathering or broadcasting organizations with extraordinary arrangement of misfortune. Physically for a human administrator, it appears to be tedious and practically difficult to recognize the nearness of copied rendition of unique video content. Every one of these obstacles and difficulties have made the need of building up the new component for detection of the replicated recordings. Along these lines, this component of identifying video copy has turned out as an extraordinary method to limit significant robbery and copyright issues. Because of the enormous size of the accessible multimedia content over the web with the multifaceted nature of contrasting content with distinguish duplicates, detection of these pilfered content on Internet has ended up being intricate and computationally costly activity. Recent examinations for recognizing copyright robbery issues are for the most part grouped into, Watermarking depends with Content based copy detection. These systems have its own points of interest and detriments. Watermarking embeds helpful data for example copyright data and furthermore it has low intricacy so as to get to this data from multimedia records. Utilizing this strategy some bending like Fourier change is included multimedia copy and to participate or scrutiny the multimedia object in unique structure this twisting should be evacuated through few product or players, which creates subject to those players.



So it can't be useful for online recordings which are being transferred in hundreds and thousands in number for each day.

While Content Based Copy Detection (CBCD) algorithms doesn't rely upon any data inclusion totally and are impervious to release and combination. These CBCD algorithms distinguishes separating qualities from the media copy itself and based on these component recognizes the duplication so CBCD system is more flaw evidence and increasingly viable methodology for theft detection on web. Given that enough data is accessible in video to make its one of a kind separating factor; this implies video itself recognizes itself.

We propose another plan; in this alongside CBCD system we will utilize cryptosteganography instrument to cover up discharge copyright data in multimedia duplicate to attach the copyright recognition component.

II. RESEARCH METHODOLOGY

Watermarking system was utilized for a similar motivation behind theft detection. Utilizing this procedure some twisting like Fourier change is included multimedia duplicate and to participate or outlook the multimedia object in unique structure this contortion should be evacuated by certain virtual products or players, which creates subject to those players. We propose another plan that is based on utilizing the cloud of numerous product assets which by and large cooperates to partition the registering task. The fundamental idea which is being utilized is "Content-based copy detection" (CBCD) system which is a viable method for identifying multimedia copyrights robbery on cloud. Various kinds of multimedia like sound, video or pictures can be ensured utilizing the CBCD component.

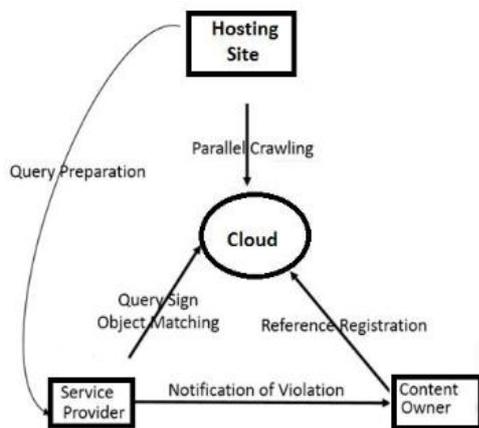


Fig.1 System Architecture

Content Based Copy Detection (CBCD): This method is free of some product depends reliance with recognizes copyrighted substances from its substance itself. In this system marks are made from content itself utilizing SIFT highlight. Multimedia objects which proprietors need to ensure are referenced by them. At that point, framework makes marks from that record and stores them in the database. The Crawl segment once a day downloads as of late transferred documents from the facilitating destinations. At that point marks are likewise made from these inquiry came about articles. Mark of question result items are then coordinated with all database marks. On the off chance that mark matches, at that point this will ambush the spot which

copies copyrighted duplicate with no rights. This is viable component, yet to secure this procedure we would utilize Audio video cryptosteganography which includes discharge data in multimedia object itself which may nor be expelled nor can be distinguished outwardly as watermarks are noticeable. This emit data is measured as copyrighted data before shaping the advanced mark. In the event that this discharge data matches with emit data from database, at that point all contents in the multimedia will be cross confirmed utilizing CBCD and along these lines copyrighted substance would be distinguished.

III. ALGORITHM USED

Key Frame Extraction Algorithm:

The algorithm looks at and ascertains the similitude of every video casing to think about whether there is an adjustment in the view or not. On the off chance that there is a change, we break the video here lastly we will break the video into shots.

```

    ForEach frame i in video
        binValueOfFrame-i = frame-i
        binValueOfFrame-j = frame-i+1
        if binValueOfFrame-i - binValueOfFrame-j > Threshold
            Add frame i in keyFramesList
        else
            keyFramesList.add(i+1)
    End
    
```

Signature Creation Algorithm

Step 1: Divide video frames as left and right parts frames and evaluate Visual Descriptors for each of them. Each frame is considered as image. Around each pixel descriptor i is computed in the image, which has a location of (x_i, y_i) . (SIFT features) using formula - $DiL = (fi1, fi2, \dots, fiF)$, $i = 1, 2, \dots, Ln$, $DiR = (fj1, fj2, \dots, fjF)$, $j = 1, 2, \dots, Rn$,

Step 2: Divide each left and right frames into Blocks of same number - (NxM)

Step 3: Compute the Visual Descriptors deviation for each descriptor in the left frame with respect to right frame and identify the nearest descriptor as - $DiL - DjR = \sqrt{(fi1 - fj1)^2 + \dots + (fiF - fjF)^2}$

Step 4: Compute Block Deviation - calculate the block deviation of each part of NxM subframes in the left frame with respect to subframe in the right frame. Say S_{bi} , where i is block index and calculated as. $\sqrt{((xi - xj) / Wb)^2 + ((yi - yj) / Hb)^2}$ **Step 5:** Create Signature. The signature from these corresponding frames is: $(S_{b1}, S_{b2}, \dots, S_{bN})$.

IV. SIMULATION RESULTS

Precision along with recall esteems are assessed by fluctuating the threshold esteem. The following are the precision and recall normal incentive among all classes: 1. Precision (level of returned duplicates that are genuine duplicates),

2. Recall (level of returned duplicates that are false duplicates).

Table.1 Variation of Precision and Recall Value based on Threshold Value

Threshold	Precision	Recall
5	0.284	0.481
10	0.316	0.479
15	0.332	0.467
20	0.376	0.459
25	0.405	0.421
30	0.411	0.398
35	0.423	0.345
40	0.435	0.297
45	0.449	0.217
50	0.458	0.186

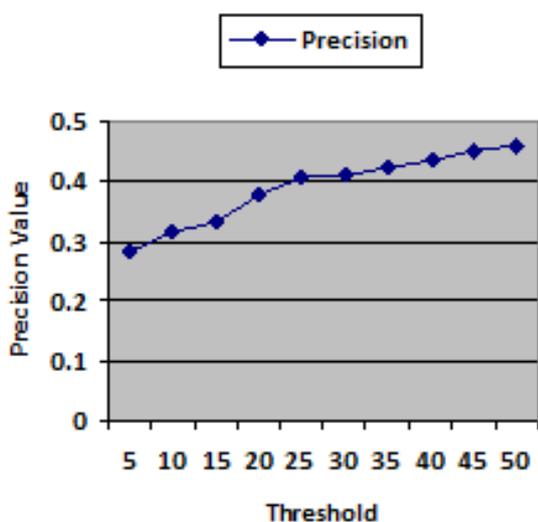


Fig.2 Precision Curve

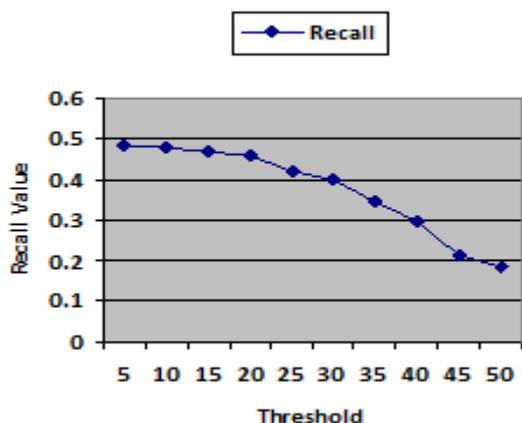


Fig.3 Recall Curve

To acquire this PR bend, the threshold is changed from 5 to 50, and figured the precision and recall for every threshold. PR bends are a standard assessment strategy in picture recovery, as they contain rich data and can without much of a stretch be perused. The outcomes unmistakably show that framework can accomplish both high precision and recall. For instance, a precision of 99% with a recall of beyond what 85% can be accomplished. The outcomes plainly depict that how the precision and recall change with the threshold parameter s.

The outcomes show that technique can accomplish precision and recall estimations of over 85% for a wide scope of multimedia altering classifications. This implies framework doesn't just give high exactness, however it is extremely delicate to the threshold s, so specialist organization can change the threshold according to the seriousness of the issue which is an interior framework parameter. As such, the framework overseer can precisely tweak s depending the framework necessities.

V. CONCLUSION

Content based multimedia copy protection framework is a novel structure for video/picture copyright security framework on cloud. The framework is based on embeddings advanced marks utilizing picture cryptosteganography which includes discharge data in multimedia object itself as a copyright data in the media itself and approving it with the goal that it very well may be utilized to secure the content based copy detection technique. This system will identify copyrighted multimedia taking and will stop misfortune to content proprietor due to wrongfully copying copyrighted material. Anyway this work isn't covering the robbery checking in the regions where live minutes are broadcast on internet broadcasting destinations. This zone needs be broadened further.

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